

32-BIT MCU FAMILY

RENESAS RA6E1 GROUP

200MHz Arm® Cortex®-M33, Entry-Line with High Performance & Streamlined Connectivity

The Renesas RA6E1 group uses the high-performance Arm® Cortex®-M33 core with TrustZone. The RA6E1 is built on a highly efficient 40nm process and is supported by an open and flexible ecosystem concept—the Flexible Software Package (FSP) —and is the perfect entry point into the RA Family of microcontrollers.

The RA6E1 is suitable for entry IoT applications requiring streamlined feature and connectivity integration including Ethernet, and unprecedented performance of 790.75 CoreMark, which are 3.95CoreMark / MHz.

RENESAS RA6 Series	RA6M1	RA6M2	RA6M3	RA6M4	RA6M5	RA6E1
Performance Range	120MHz, Arm® Cortex®-M4	120MHz Arm® Cortex®-M4	120MHz, Arm® Cortex®-M4	200MHz, Arm® Cortex®-M33	200MHz, Arm® Cortex-M33	200MHz, Arm® Cortex-M33
Memory Range	512kB Flash, 256kB RAM	512kB-1MB Flash, 384kB RAM	1-2MB Flash, 640kB RAM	512kB-1MB Flash, 192kB RAM	1-2MB Flash, 512kB RAM	512kB-1MB Flash, 256kB RAM
Package	64-100pin QFN/LQFP/LGA	100-145pin LQFP/LGA	100-176pin LQFP/BGA	64-144pin LQFP/LGA	100-176pin LQFP/BGA	48-100pin QFN/LQFP
USB, CAN	•	•	•	•	•	•
Security	•	•	•	TrustZone®	TrustZone®	TrustZone®
HMI	•	•	TFT controller/ 2D accelerator/ JPEG decoder	•	•	-
Other Features	Low cost	Ethernet MAC with DMA	Ethernet MAC with DMA	Ethernet MAC with DMA	Ethernet MAC with DMA, CAN FD	Ethernet MAC with DMA

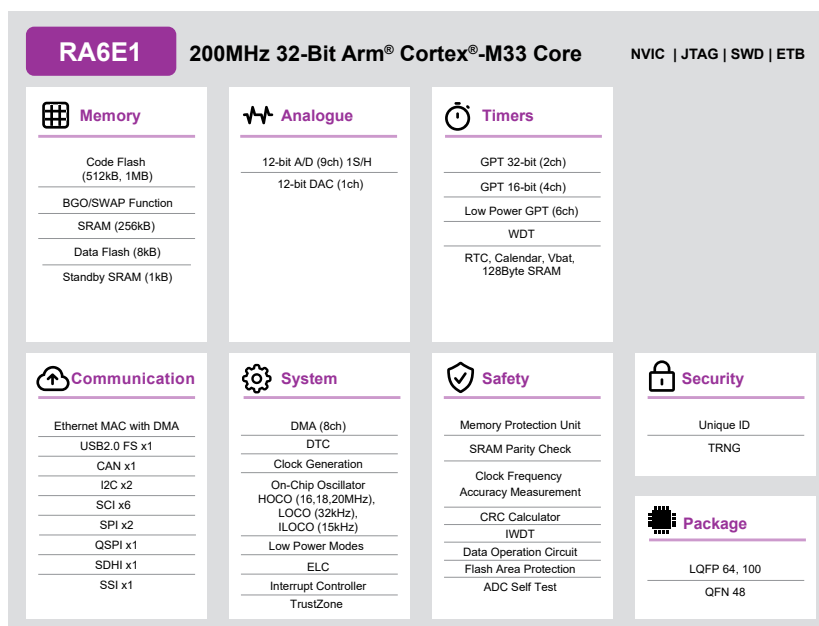
Target Applications

- General purpose
- Gateways (Cloud Gateway)
- Smart home and Building Automation (Fingerprint Sensor, Voice recognition & Smart control, Edge Keyword detection)
- Industrial sensor hub with for flow, humidity, temperature, etc.
- Home entertainment (housekeeping MCU)

Key Features

- 200MHz Arm Cortex-M33 with TrustZone
- 512kB – 1MB Flash memory and 256kB SRAM
- 8kB Data Flash to store data as in EEPROM
- 1kB Stand-by SRAM
- Scalable from 48-pin to 100-pin packages
- Ethernet with MAC
- USB 2.0 Full Speed
- CAN 2.0B
- Quad SPI
- SCI (UART, Simple SPI, Simple I2C)
- SPI/I2C multi-master interface
- SDHI and MMC

Block Diagram



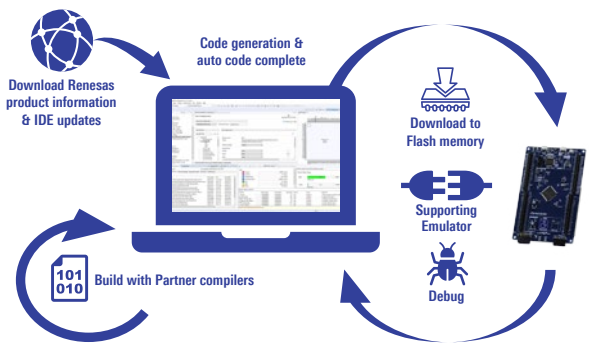
RENESAS RA6E1 GROUP

Benefits

- Entry-Line with streamlined connectivity including Ethernet (with integrated MAC), USB 2.0 Full-Speed, serial communication (SCI with flexible synchronous and asynchronous modes, I2C, SPI), CAN, SSI, SDHI, QSPI, and the great Renesas Timer and advanced analog IP's
- Unprecedented performance in the Entry-Line up to 200MHz with 790.75 Coremark, this is 3.95CoreMark / MHz
- Hardware and Software compatibility and scalability from the RA family Entry-Line to the Mainstream-line and ASSP-products

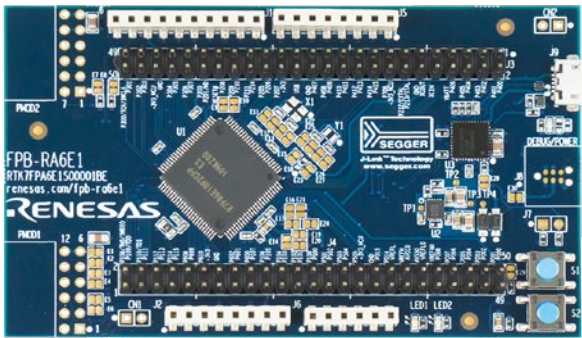
Tools and Support

IDE	Renesas e²studio	Keil MDK	IAR EWARM
Compiler	■ GCC ■ Arm Compiler	■ Arm Compiler	■ IAR Arm Compiler
Debugger	■ Renesas E2/E2 Lite ■ SEGGER J-Link	■ SEGGER J-Link	■ IAR I-Jet ■ SEGGER J-Link
Programmer	■ Renesas PG-FP6 ■ SEGGER J-Flash ■ Third party solutions		



Evaluation Kit

- Fast Prototyping Board including On-Chip debugger (FPB-RA6E1)
 - Part name: RTK7FPA6E1S00001BE



FPB-RA6E1

Ordering References

Part name	Flash	1MB	R7FA6E10F2CNE	R7FA6E10F2CFM	R7FA6E10F2CFP
		512KB	R7FA6E10D2CNE	R7FA6E10D2CFM	R7FA6E10D2CFP
RAM			256KB	256KB	256KB
DataFlash			8KB	8KB	8KB
Operating Temperature			-40/+85°C	-40/+85°C	-40/+85°C
Package			QFN48 pin	LQFP64 pin	LQFP100 pin
Package dimensions			7x7mm body; (9x9mm)	10x10mm body; (12x12mm)	14x14mm body; (16x16mm)
Pin pitch			0.5mm	0.5mm	0.5mm

For more details, please visit www.renesas.com/ra6e1

renesas.com

Corporate Headquarters
TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Document No.: R01PF0216EU0100

Trademarks
Arm® and Cortex® are registered trademarks of Arm Limited. Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

© 2021 Renesas Electronics Corporation. All rights reserved.

Contact information
For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:
www.renesas.com/contact/